1/2 020 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS -U-

AUTHOR--BOGACH, G.F.

B

COUNTRY OF INFO--USSR

SOURCE--VOYENNO-MEDITSINSKIY ZHURNAL, NO 3, 1970, PP 49-51

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--TUBERCULOSIS, LUNG, THORACIC SURGERY, DIAGNOSTIC MEDICINE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/0696 STEP NO--UR/0177/70/000/003/0049/0051

CIRC ACCESSION NO--AP0134434

UNCLASSIFIED

2/2 020 UNCLASSIFIED PROCESSING DATE--27NOV70
CIRC ACCESSION NO--AP0134434
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. NEW METHODS OF DIAGNOSTIC INVESTIGATIONS AND INTUBATIONAL NARCOSIS IN PULMONARY TUBERCULOSIS ARE BEING WORKED OUT AND INTRODUCED IN THE PHTHIOSURGICAL SECTION OF THE DISTRICT HOSPITAL OF THE LENINGRAD MILITARY DISTRICT. INCREASING THE PERIOD OF TREATMENT OF PATIENTS WITH TUBERCULOSIS WITH ANTIBACTERIAL PREPARATIONS HAS CONSIDERABLY REDUCED THE FREQUENCY OF POSTOPERATIVE COMPLICATIONS AND HAS LED TO A RE EXAMINATION OF THE INDICATIONS FOR VARIOUS TYPES OF OPERATIVE INTERVENTIONS. THE CLOSE CONNECTION OF THE HOSPITAL WITH THE CLINIC OF HOSPITAL SURGERY OF THE MILITARY MEDICAL ACADEMY IMENI S. M. KOROV AND THE SURGICAL DIVISION OF THE LENINGRAD TUBERCULOSIS INSTITUTE HAVE CONTRIBUTED TO THE SUCCESSES ACHIEVED IN THE SURGICAL TREATMENT OF PATIENTS WITH TUBERCULOSIS. IN 1964-1966 LUNG RESECTIONS WERE PERFORMED ON 27PERCENT OF THE PATIENTS ADMITTED FOR CAVERNOUS FORMS OF TUBERCULOSIS, AND ON THE WHOLE AMOUNTED TO 59PERCENT OF ALL PHTHISIOSURGICAL INTERVENTIONS. WITH THE INTRODUCTION OF THAT OPERATION INTO PRACTICE, ESPECIALLY OF SO CALLED ECONOMICAL RESECTION (SEGMENTECTOMY, AND WEDGE SHAPED AND PLANE RESECTIONS), THE INDICATIONS FOR ARTIFICIAL PNEUMOTHORAX AND EXTRAPLEURAL PEEUMOLYSIS HAVE BEEN GREATLY CONTRACTED, AND SUCH INTERVENTIONS AS EXTRAPLEURAL FILLING, OLEOTHORAX, AND THORACOPLASTIC SURGERY HAVE BEEN GIVEN UP ALTOGETHER. PNEUMOTHORAX HAS BEGUN TO BE APPLIED ONLY ON PATIENTS FOR WHOM PULMONARY RESECTION IS COUNTERINDICATED. THE FIRST RESECTION OF THE UPPER LOBE OF THE RIGHT LUNG FOR CAVERNOUS TUBERCULOSIS WAS PERFORMED IN 1953.

UNCLASSIFIED

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002200410020-0"

USSR

UDC 612.014.42

[redacted], KONDRAT'EVA, I. D., and MIRUTENKO, V. I., Institute of Physiology and Chair of Biophysics, Kiev University

"Effect of a Constant Magnetic Field on the Membrane Potential of Neural Cells in Ganglia Isolated From the Mollusk Planorbis corneus"

Kiev, Fiziologichnyy Zhurnal, Vol 17, No 6, Nov/Dec 71, pp 760-764

Abstract: Results of experiments conducted to determine the effect of constant magnetic fields (CMF) with intensities of 130, 600, 1,300, and 1,800 H on the membrane potential (MP) of neural cells in ganglia isolated from the mollusk Planorbis corneus are presented in the article. The CMF were formed by passing a direct current through an electromagnet. The ring-shaped isolated ganglion consisting of six pairs of symmetric and one pair of nonsymmetric ganglia was suspended between the two poles of the electromagnet in a special chamber through which a solution standard for this type of mollusks was flowing. Microelectrodes filled with a 3 M solution of KCl were used to record the MP of the cells. The data obtained revealed that 6-hour exposure of the cells to the action of the the CMF with intensities of 130, 600, 1,300 and 1,800 H reduces the MP of the cells respectively by 45, 40, 47 and 40.7% as compared with controls. The changes in the MP values, however, are not related to the

1/2

USSR

BOGACH, P. G., et al., Fiziologichnyy Zhurnal, Vol 17, No 6, Nov/Dec 71, pp 760-764

intensities of the CMF, or duration of their action, for the higher the intensity of the CMF the greater the reduction rate of the MP even following exposure for only a period of 4 hours to the action of the CMF. This is manifested also by the deep irreversible changes in the nerve cells when the CMF action is suspended for 3 hours. The assumption is that the biological effect of CMF on the MP is due to the action of the fields on the free radicals of the active metabolite cells with the subsequent effect on the permeability of the cellular membrane to the ions responsible for the generation of the MP.

2/2

USSR

UDC 612.82:612.32.38

BOGACH, P. G.

"Limbic and Hypothalamic Regulation of Digestive Tract Functions and Food and Water Intake"

Kiev, Fiziologichniy Zhurnal, No 5, 1973, pp 608-616

Translation of abstract: The role of various nuclei and structures of the limbic system and hypothalamus in regulating digestive tract functions and food and water intake was studied in chronic experiments on dogs involving electrostimulation and recording of the EEG. The method of selective destruction or creation of lesions was used to determine the participation of nuclei of the amygdaloid complex, pyriform cortex, and globus pallidus. The mechanisms by which stimulation of the various hypothalamic nuclei affected gastric mobility and secretion and absorption of food and water were elucidated. The role of the anterior cingulate gyrus in influencing these functions of the digestive apparatus, the significance of different nuclei of the amygdaloid complex and structures of the pyriform cortex in regulating these functions, and the relation of the globus pallidus to drinking and eating were established. A comparative analysis was made of the similarities

1/2

USSR

BOGACH, P. G., Fiziologichniy Zhurnal, No 5, 1973, pp 608-616

between the various structures and nuclei of the limbic system and hypothalamus in their influence on the above autonomic functions. Possible mechanisms of the different types of integrative activity of the hypothalamus under different conditions and needs of the organism are discussed.

Acc. Nr: AP0044195 Ref. Code: UR 0239

PRIMARY SOURCE: Fiziologicheskiy Zhurnal, 1970, Vol 56, Nr 1, pp 102-107

INVESTIGATION INTO SECONDARY PERISTALSIS IN VARIOUS PARTS OF ESOPHAGUS IN DOG

Bogach, P. G.; Krasil'shchikov, K. B.; Groysman, S. D.

From the Institute of Physiology, T. G. Shevchenko State University, Kiev

In spite of the different character of the motor reactions in various parts of the esophagus to mechanical stimulation the frequency of the secondary peristalsis in all parts of the dog esophagus was shown to be the same, viz. 8--14 contractions a minute.

The frequency of the peristalsis in esophagus appears to be unchanged with the increase of the stimulating baloon volume by 4 times (10—40 ml.). Only the strong mechanical stimulation of esophagus which evoked pain depressed the secondary esophageal peristalsis. The excitability of esophagus to mechanical stimulation had a tendency to increase in distal direction.

REEL/FRAME
19770681

BOGACH V.A.

AA 0044290

UR 0482

Soviet Inventions Illustrated, Section II Electrical, Derwent,

241551 EXPANSION ATTACHMENT FOR A BUBBLE CHAMBER PLACED IN A MAGNETIC FIELD is made faster acting. Moving coil (1) made of superconductive material is held by ring (2) which is coupled to moving wall (5) of chamber (6) by means of bracket (3) and tierod (4). The chamber is situated in the magnetic field of coil (7). The working temperature of the equipment is maintained by cryostat (8). Coil (1) is influenced by the high radial leakage field of coil (7) which results in a force acting on tierod (4).when current flows in coil (1). The corresponding change in the position of moving wall (5) brings about a change of pressure and the expansion of liquid within chamber (6); simultaneously the potential energy of gas in chamber (9) is increased. Resonant operation is achieved by the expanding system which forms an electromechanical loop where the frequency of oscillation corresponds to the frequency of current in the moving coil.
12.4.68 as 1232169/26-25.V.A.BOGACH et alia.NUCLEAR RES.INST.(8.9.69) Bul 14/18.4.69. Class 21g. Int.Cl. H 05g..

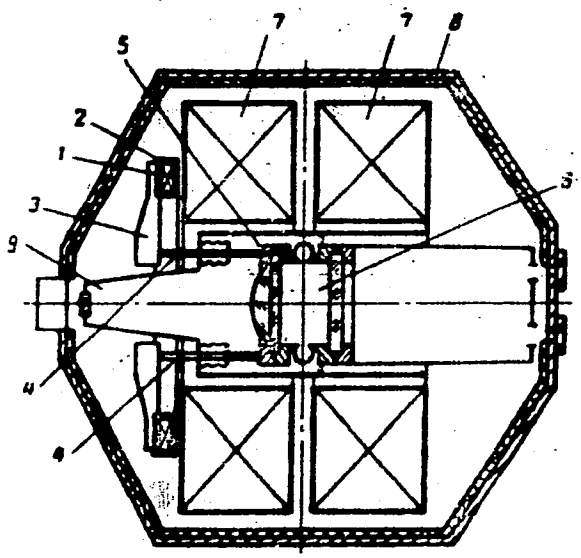
1/70

21

1/3

19770834

AA0044290



2/3

19770835

AA0044290

AUTHORS: Bogach, V. A.; Grebinnik, V. G.; Zhukov, V. A.; Manych, A.P.; Rudin, Yu. I.; Selivanov, G. I.;

Ob"edinennyy Institut Yadernykh Issledovaniy

19770836

3/3

1/2 028 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--MECHANICAL MODEL OF LONG WAVE OSCILLATIONS IN FERRO ELECTRIC TYPE CRYSTALS -U-

AUTHOR-(02)-KOSEVICH, A.M., BOGACHEK, YE.N.

B

COUNTRY OF INFO--USSR

SOURCE--UKR. FIZ. ZH. (RUSS. ED.) 1970, 15(3), 477-86.

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--FERROELECTRIC CRYSTAL, OSCILLATION, MODEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3007/0874 STEP NO--UR/0185/70/015/003/0477/0486

CIRC ACCESSION NO--AP0136308

UNCLASSIFIED

2/2 028 UNCLASSIFIED PROCESSING DATE--04DEC70
CIRC ACCESSION NO--AP0136308
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE FEATURES WERE STUDIED OF THE DISPERSION RULE FOR LONG WAVE OSCILLATION DUE TO THE CRYSTAL'S LACK OF A CENTER OF INVERSION. A VARIATION OF THE MECH. MODEL DISCUSSED EARLIER (H. HAHN AND BIEM, 1963) WAS STUDIED. THE N FOR SUCH CRYSTALS WAS ALSO STUDIED. FACILITY: KHAR'KOV. GOSUNIV., KHARKOV, USSR.

UNCLASSIFIED

USSR

UDC 621.643.001.5

MANDEL'BERG, S. L., SEMENOV, S. YE., and BOGACHEK, YU. L., Institute of Electric Welding imeni Ye. O. Paton, Kiev

"Increasing the Impact Strength of Gas Pipe Weld Metal"

Moscow, Stroitel'stvo Truboprovodov, No 7, Jul 71, pp 23-26

Abstract: The article describes work performed at the Institute of Electric Welding imeni Ye. O. Paton to estimate the impact strength level of the weld metal of gas pipes and to determine ways of increasing it. Tests of expanded 17G1S steel pipes showed that the impact strength of the welds at -40° C was considerably less than for hot-straightened or thermally strengthened pipes. Low impact strength values are observed at -40 and -60° C right after welding. Expansion causes cold deformation of the metal, which produces an additional reduction in the impact strength of the welds. To increase the impact strength of the metal of the deformed welds, a more homogeneous structure with refined grains must be obtained. For expanded 17G1S steel pipes

USSR

MANDEL'BERG, S. L., et al., Stroitel'stvo Truboprovodov, No 7, Jul 71, pp 23-26

this can be done by using a special electrode wire alloyed with molybdenum and nickel (Sv-10NM or Sv-08KhN2M wire) in conjunction with a high-silica flux, as well as by postheating under normalization or temper quenching conditions.

2/2

USSR

UDC 621.372.54:621.316.925

SIROTA, I. M. and BOGACHENKO, A. Ye

"Band—Pass Filters for Relay Protection Devices"

Probl. tekhn. electrodinamiki. Resp. mezhved. sb. (Problems of Technical Electrodynamics. Republic Interdepartmental Collection) No 37, 1972, pp 40 - 50 (from RZh-Avtomatika Telemechanika i Vychislitel'naya Tekhnika, No 3, Mar 73, Abstract No 3 A344 by the authors)

Translation: The circuits considered are two-unit, L-shaped, LC voltage and current frequency filters. On the basis of quadripole theory, those relationships of the elements are found which will best tune out interference and yield the necessary output power from the filters for a voltage and current at 100 Hz. The parameters of filter elements which will satisfy the requirements of relay protection are selected. Seven illustrations, one table.

1/1

1/2 024 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--ESSENCE OF THE PATHOLOGICAL PROCESS IN CASES OF EPICONDYLITIS OF THE HUMERUS -U-

AUTHOR-(02)-ROMANOVSKIY, M.G., BOGACHENKO, N.I.

COUNTRY OF INFO--USSR

SOURCE--ORTOP TRAVMATOL PROT 31(2): 56-59. 1970

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--X RAY STUDY, BONE DISEASE, MUSCULOSKELETAL SYSTEM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605015/F06 STEP NO--UR/9115/70/031/002/0056/0059

CIRC ACCESSION NO--AP0140640

UNCLASSIFIED

2/2 024 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0140640

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CLINICAL X RAY STUDIES WERE MADE OF 80 PATIENTS WITH EPICONDYLITIS AGED 26 TO 53 YR WITH DIFFERENT PHASES OF THE DISEASE. THESE STUDIES INDICATED THAT THE PATHOLOGICAL PROCESS IN EIPICONDYLITIS OF THE HUMERUS IN THE INITIAL PHASE IS PRIMARILY LOCALIZED AT THE SITE OF TRANSITION OF TENDON INTO THE BONE TISSUE OF THE EPICONDYLE. LATER, AS THE DISEASE DEVELOPS, SPREAD AND PENETRATION OF THE DEGENERATIVE DYSTROPHIC ALTERATIONS OCCURS WITH THE PRESENCE OF ASEPTIC INFLAMMATION IN THE MUSCLE TENDONS ATTACHED TO THE EPICONDYLE, IN THE PERIOSTEUM, BONY TISSUE, LIGAMENTS CONNECTED TO THE CAPSULE OF THE ELBOW JOINT, AND IN THE NERVES WHICH INNERVATE THE COMPONENTS OF THE ELBOW JOINT. WITH THE CLINICAL PROGRESSION OF THE DISEASE, DAMAGE TO NERVE FIBERS CAUSES THE CHARACTERISTIC PAIN SYNDROME DETECTED UPON EXAMINATION OF THE PATIENT. THE EPICONDYLE OF THE HUMERUS IS ONLY THE POINT AT WHICH THE PAIN IS LOCALIZED BY PROJECTION. THE CHANGES OCCURRING IN IT ARE A SECONDARY MANIFESTATION OF THE DISEASE. THEREFORE, THE TERM EPICONDYLITIS OF THE HUMERUS DOES NOT REFLECT THE ESSENCE OF THE DISEASE IN ALL ITS VARIEGATED CLINICAL MANIFESTATIONS. IT WOULD BE MORE CORRECT TO CALL IT PERIARTHRITIS OF THE ARTICULATIO CUTIBI. FACILITY: KIEV INST. POSTGRAD. MED., KIEV, USSR.

UNCLASSIFIED

USSR

UDC: 621.374

BOGACHEV, A. I., ISAKOV, Yu. D., LYAPINSKIY, Yu. V., LYAPINSKIY, V. V., and KHORN, V. N.

"Method of Transforming Time Shift Between Pulses"

Moscow, Izmeritel'naya tekhnika, No 3, 1972, pp 52-54

Abstract: The necessity occasionally arises, in automatic control and computer engineering, to determine the time shift of one pulse train relative to another or to transform it linearly into pulse widths. A device for doing this is discussed in this article. A block diagram of the device is given and its operation explained, together with a timing diagram. Some details of the method of its testing are given. The device is subject to two types of error: one, in determining the the moment of passage of zero value of the sinusoidal signal; two, in the magnitude of the insensitivity zone. Advice in the reduction of these errors is provided. The instrument can be used in the mass production of functional elements.

1/1

USSR

UDC: 517.514

BOGACHEV, B. M.

"Weight Spaces with Various Weights with Respect to Various Variables"

Teoremy Vlozheniya i Ikh Prilozheniya [Imbedding Theorems and Their Applications--Collection of Works], Moscow, Nauka Press, 1970, pp 23-34, (Translated from Referativnyy Zhurnal Matematika, No 8, 1970, Abstract No 8B92, by the author).

Translation: A functional space with different weights for different directions is studied. The direct and inverse theorems of traces for one quadrant are proven.

1/1

USSR UDC 669.245'71.017.3

ARKHANGEL'SKAYA, A. A., BOGACHEV, I. N., LITVINOV, V. S., and PANTSYREVA, Ye. G., Ural Polytechnic Institute imeni S. M. Kirov

"Phase Transformations in Nickel-Aluminum Alloys With Cesium Chloride Lattice"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 34, No 2, Aug 72, pp 541-546

Abstract: A study was made by metallographic, dilatometric, and roentgenostructural methods of the effects of the degree of nickel supersaturation on phase transformations during heating in substitutional Ni-Al-base solid solutions. The diffusionless transformation of a part of martensite into the β-phase in alloys with 65 and 66 at% Ni is accompanied by a separation of Ni_3Al dispersion particles. At the same time, a reduction of the specific volume of martensite and β-phase takes place. The transformation in the 240-360 deg. temperature interval results in intense hardening of the alloy: its microhardness increases up to 900 kg/mm^2. Analogous effects are observed for the 64% Ni-2% Co-34% Al and 64% Ni-2% Fe- 34% Al ternary alloys. It is supposed that volumetric changes accompanying the formation of martensite and its transformation during heating must affect the properties

1/2

USSR

ARKHANGEL'SKAYA, A. A., et al., Fizika Metallov i Metallovedeniye, Vol 34, No 2, Aug 72, pp 541-546

of coatings, particularly during repeated heating and cooling, develop microcracks in the protective coating, decay the heat-resistant oxide film, and intensify the diffusion processes in the coating. Three figures, one table, five bibliographic references.

2/2

USSR

UDC:669.245'71.017.3

LITVINOV, V. S., BOGACHEV, I. N., ARKHANGEL'SKAYA, A. A., PANTSYREVA, Ye. G.,
Ural Polytechnic Institute imeni Kirov
"Electron Microscope Investigation of Nickel-Aluminum Alloy Martensite"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 36, No 2, 1973,
pp 388-393

Abstract: The structure of the alloy 64 at.% Ni + 36 at.% Al, in which martensite conversion has occurred upon cooling from high temperatures (1200°C) at rates preventing separation of excess nickel, is studied by an electron-microscope method. It is shown that the martensite needles consist of thin plates in twin orientation in relation to each other with twinning planes in the set {101}. A β-phase shear plan is suggested, leading to the formation of such a martensite structure.

1/1

USSR UDC: 620.183

BOGACHEV, I. N., VEKSLER, Yu. G., SOROKIN, V. G., Sverdlovsk

"Influence of Supersonic Gas Streams on the Structure and Heat Resistance of Metal Alloys"

Izvestiya Akademii Nauk SSSR, Metally, No 4, Jul-Aug 73, pp 139-143.

Abstract: The influence of a high-speed airstream on the heat resistance of metal materials was studied on an installation allowing testing of erosion resistance, short-term creep, strength and thermal fatigue over a broad range of temperatures and airstream velocities. The dynamic interaction of metals and alloys with high-velocity gas streams at high temperatures has a significant influence on the properties, composition and structure of the metal surface due to the corrosive and erosive influence of the gas stream. The disruption of the stability of the material surface under dynamic loading conditions leads to significant changes in the mechanical properties in comparison with standard tests: the creep resistance under thermal cycling, strength and ductility all decrease. As the gas stream velocity and test temperature increases, these effects also increase.

Prediction of the durability and operational reliability of parts working in contact with high velocity gas streams should be based on the results of

-USSR

Bogachev, I. N., Veksler, Yu. G., Sorokin, V. G., Izvestiya Akademii Nauk SSSR, Metally, No 4, Jul-Aug 73, pp 139-143.

determination of mechanical characteristics under conditions as close as possible to usage conditions.

USSR UDC 537.533:54

BOGACHEV, I. N., KUDARAUSKAS, I. A., and KUZNETSOV, V. O., Ural Polytechnical Institute imeni C. M. Kirov, Sverslovsk

"Effect of Adsorption on Kinetics of the Exoelectronic Emission"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 47, No 6, Jun 73, pp 1578-1579

Abstract: Exoemission of tin and zinc subjected to deformation by tension and rupture under vacuum (up to $2 \cdot 10^{-5}$ torr) was studied. The emission was stimulated by α mercury lamp, the rate of deformation was $4.24 \cdot 10^{-4}$ sec^{-1}. The experiment was based on the cyclic increase of pressure in vacuum from $2 \cdot 10^{-6}$ to $5 \cdot 10^{-4}$ torr. After rupturing the tin samples at $5 \cdot 10^{-4}$ torr some increase in emission was observed, followed by a gradual decrease in the emission intensity. When the vacuum was increased twofold, the emission at first decreased, then reached a maximum and decreased again. Similar phenomena were observed in the case of zinc, but decreases and increases were of much high magnitude. This behavior of emission is attributed to adsorption processes. Filling the vacuum chamber with air to $5 \cdot 10^{-4}$ torr pressure facilitated the adsorption process and it was accompanied by an intensive exoemission. If samples were held at this pressure for $\sim$1 min., several increases and decreases in the exoemission were observed. However, during

1/2

USSR

BOGACHEV, I. N., et al., Zhurnal Fizicheskoy Khimii, Vol 47, No 6, Jun 73, pp 1578-1579

the second increase in pressure, the kinetics of exoemission was not influenced much in the case of zinc but facilitated a more rapid decrease of the exo-emission for tin. This indicated the irreversible nature of the emission process.

2/2

USSR

UDC 669.14.018.2

BOGACHEV, I. N.

Kavitatsionnoye Razrusheniye i Kavitatsionnostoykiye Splavy (Cavitation Failure and Cavitation-Resistant Alloys), Moscow, Metallurgiya, 1972, 192 pp

Translation of Introduction: One of the important problems of the modern science of metals is increasing the service life of machine parts and mechanisms. The solution of the problem is more complex each year owing to the fact that for new machines, forced modes of operation, increased capacities, speeds, and operating temperatures are specified. Conditions of loading are likewise complicated and impulse, vibration, and impact loads are increased.

Failure of parts and assemblies in many cases starts at the surface layers. Historically, contact failure during friction and wear, i.e., in metal-metal contact, has been the first thing studied in the overall problem of strength. As a result, various ideas have developed regarding the relationship of structure and strength of the surface layer to the wear resistance of metal parts.

USSR

BOGACHEV, I. N., Kavitatsionnoye Razrusheniye i Kavitatsionnostoykiye Splavy, Metallurgiya, 1972, 192 pp

The physical state of the surface, microgeometry, strength, and nature of hardening under contact loading take on special significance under conditions of contact loading. In essence, a new field of metal science is being created in which surface layers are the topic of investigation.

The concept of contact and contact surface means the perception of large loads localized in small volumes and characterized by frequency and dynamics of their application.

Contact surfaces can be different: contact of solids (friction and wear), solid-liquid contact (cavitation, cavitation erosion), and solid-gas contact (gas erosion). The complication of contact loading can be associated with a series of secondary phenomena including change of temperature, oxidation, and the formation of electrical and other phenomena. In spite of the different forms of contacting media, in the kinetics and mechanism of metal surface failure, much can be observed overall and, therefore, failure in contact with one or another medium can be examined as the partial case of contact strength.

USSR

BOGACHEV, I. N., Kavitatsionnoye Razrusheniye i Kavitatsionnostoykiye Splavy, Metallurgiya, 1972, 192 pp

Information and data are presented in this book on the failure of metals during the cavitation action of liquid (water) flow. This field is of substantial interest in hydraulic machine building (turbines, pumps) and other branches of the national economy (screw shafts, engine casings, etc.).

Cavitation erosion removes metal as much as corrosion does; thus it can be seen that much importance attaches to the problem of increasing cavitation resistance in order to reduce large losses of metal and to increase the service life of parts in hydraulic machine building.

Over the years the Problem Laboratory of Metal Science of the Ural Polytechnic Institute imeni S. M. Kirov has developed general principles for the selection of cavitation-resistant steels and the practical application of these steels to the development of new cavitation-resistant steels having better properties than existing steels. As a result of research, a number of high-strength steels have been proposed. This book presents the works of personnel of the aforementioned laboratory, done under the author's supervision.
3/6

USSR

BOGACHEV, I. N., Kavitatsionnoye Razrusheniye i Kavitatsionnostoykiye Splavy, Metallurgiya, 1972, 192 pp

In the study and development of Cr-Mn steels, L. S. Malinov, T. M. Maslakova, R. I. Mints, and T. D. Eysmondt participated. L. S. Malinov, T. M. Maslakova, B. A. Potekhin, N. V. Zvigintsev, and V. A. Strizhak were involved in the development of cast maraging steels. Undergraduate and graduate students of the Department of Heat Treatment and Metal Physics also took part in the research.

V. P. Korobeynikov, L. I. Lepekhina, and T. M. Maslakova prepared the manuscript for print.

Table of Contents: Page

4/6

USSR

BOGACHEV, I. N., Kavitatsionnoye Razrusheniye i Kavitatsionnostoykiye Splavy, Metallurgiya, 1972, 192 pp

USSR

BOGACHEV, I. N., Kavitatsionnoye Razrusheniye i Kavitatsionnostoykiye Splavy, Metallurgiya, 1972, 192 pp

6/6

BOGACHEV I. N.

Rolling Steel

UDC 669.15669.017.25539.4

EFFECT OF WARM ROLLING ON THE MECHANICAL PROPERTIES OF UNSTABLE CHROMIUM-MANGANESE AUSTENITIC STEEL

[Article by I. N. Bogachev, T. D. Eygmondt, A. V. Fupman, Ural Polytechnic Institute Imeni S. M. Kirov, Moscow, Fizika metallov i metallovedeniye, Russian, Vol 34, No 5, 1962, submitted 8 October 1971, pp 1034-1041]

A study was made of the possibility of increasing the set of mechanical properties of unstable chromium-manganese austenitic steel by deformation in the 300-500° C range. Along with an increase in the strength properties, the warm rolling leads to an increase in the plastic properties of the steel with active development of martensitic conversion with deformation. This is connected with stabilization of the austenite with respect to phase transformations. After warm rolling the amount of alpha-phase in the test process increases gradually with an increase in the degree of deformation which insures good plasticity of these steels.

Warm deformation is widely used for strengthening austenitic steel [1-3]. The majority of studies in this area have been made on chromium-nickel steel. In this paper a study has been made on chromium-manganese austenitic chromium-manganese steel. The level of the mechanical properties in the temperature range of 300-550° on the effect of warm rolling in (σ_B, δ) of the unstable austenitic steels depends to a high degree on the intensity of development of the martensitic conversion during testing. Accordingly, a study is made of the effect of the temperature and degree of Preliminary deformation on the development of the martensitic γ-α transformations with subsequent deformation.

Experimental Data and Procedure

A study is made of the steel having different stability of the austenite, the content of carbon and the content of the carbide-forming element -- chromium (Table 1).

Table 1

Type of steel	C	Cr	Mn	Si	S	P
30Kh2G10	0.30	2.38	0.38			
30Kh16G10	0.32	16.36	0.14	0.0001	0.0021	
42Kh10G6	0.42	9.51	0.35			
60G7 (sic)	0.60	0.80	0.80			
20Kh10G10	0.20	10.10	0.35	0.005	0.005	

The steel was made in an induction furnace. After homogenizing annealing, the ingots weighing 8 kg were forged into bars which went through the austenizing stage at 1,100° with subsequent cooling in water. The deformation was realized by rolling on a roll pass mill in the 300-550° range. The heating of the specimens to the deformation temperature and heating them during rolling took place in a salt bath. The billets 10 x 10 mm in cross section were rolled, then specimens were made from them for mechanical testing.

The effect of the temperature and degree of preliminary deformation on the development of the γ⇄α transformation during subsequent deformation was studied on a 20Kh10G10 steel wire. The deformation was realized by twisting.

The amount of α-phase formed during deformation was determined using the Shteynberg-Zyuzin ballistic magnetometer. An armco iron sample was used as the standard. The effect of the alloying elements on the magnetic saturation of the investigated steel was considered for the calculation. The relative ε-phase content was estimated by varying the density $\Delta\rho/\rho$ as a result of the γ⇄α transformation [4]. The mechanical properties were determined using specimens 3 mm in diameter and with l_0 = 20 mm on the IM-4R machine.

Results and Discussion of the Results

The amount of α-martensite formed in the steel during plastic flow by torsion is illustrated in Figure 1. For steel with 0.3 percent C (30Kh2G10 and 30Kh16G10) an increase in the chromium content leads to stabilization of the austenite with respect to γ⇄α conversion during deformation. Thus, after 15 percent deformation in 30Kh2G10 steel, 29 percent α-phase is formed; in 30Kh16G10 steel, 1 percent. Torsion fracture of 30Kh2G10 steel with intense formation of deformation martensite takes place at 17 percent deformation; for 30Kh16G10 steel in which the amount of α-phase gradually increases with an increase in the degree of deformation it takes place at 40 percent. The mechanical properties of this steel after quenching and preliminary warm rolling are presented in Table 2.

The increase in chromium content in steel with 0.3 percent C somewhat exceeds the yield point of $\sigma_{0.2}$ after quenching (from 41 to 46.2 kg/mm²); the ultimate strength σ_B increases sharply in this case: from 97.7 kg/mm² for 30Kh2G10 steel to 97.1 kg/mm² for 30Kh16G10 steel. The formation of a large amount of deformation martensite in the first steel during mechanical testing

Steels

USSR

UDC 669.1:620.193.91

BOGACHEV, I. N., ZVICINTSEV, N. V., and MASLAKOVA, T. M., Ural Polytechnic Institute imeni S. M. Kirov

"Effect of Alloying on the Aging Process and Strengthening of Steel with 20% Nickel"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 33, No 2, Feb 72, pp 362-368

Abstract: The effect of alloying elements on the processes of aging and strengthening was studied according to the change in hardness and a number of physical properties: thermal emf and electrical resistance. The alloys studied were : N20, N20M2, N20M5, N20K10, N20K15, N20K10M5, N20K10M5TYu, N20TYu, and N20M3TYu. An aging temperature between 400 and 550° C produced the highest hardnesses and it was found that Fe-Ni steels N20K10M5, N20TYu, N20M3TYu, and N20K10M5TYu were much harder than steels N20, N20M2, N20K10, N20K15 and N20M5, which is explained for the most part by their content of titanium and aluminum. On the other hand the harder steels had a lower thermal emf. It was concluded that the processes of aging and strengthening of precipitation hardened Fe-Ni steels was dependent on the content of Mo, Ti, Al, and Co although the effect of these elements differed for the indicated processes. Anomalies in the temperature relationship of the physical properties, dependent on Co and Mo, are weakened by Ti and Al. Four figures, 1 table, 14 bibliographic references.
1/1

USSR

UDC 669.295

BOGACHEV, I. N., DAVYDOV, V. N. and KOROBEYNIKOV, V. P.

"Removal of Scale From the Surface of Titanium Alloys Using Cavitation Treatment"

Moscow, Tsvetnyye metally, No 1, Jan 72, pp 77-78

Abstract: Described is a feasibility study on the use of ultrasonic cavitation treatment of the surface of titanium alloy sheets for either partial or complete removal of scale exclusive of the shortcomings of other methods. It is shown that preliminary loosening-up of the difficult-to-remove scale from titanium alloys by ultrasonic cavitation treatment in water reduces the subsequent pickling time 30 to 40 times, which significantly reduces the degree of hydrogenation of alloys in the process of pickling and thus improves the surface quality of the sheet material, without affecting its basic mechanical properties. The experimental materials were VT6s and VT14 hot-rolled titanium stock. A diagram of the experimental ultrasonic unit for the cavitation treatment of the surface of sheet metal specimens is shown. The subsequent chemical pickling was performed in an aqueous solution of 15% H_2SO_4 and 2% NH_4F at 20°C. The specimens were rinsed in running water for 15-20 sec. (1 illustration; 3 bibliographic references).

1/1

USSR

UDC 534.29;532.528

BOGACHEV, I. N., and KOROBEYNIKOV, V. P., Ural Polytechnic Institute imeni S. M. Kirov, Sverdlovsk

"Intensity Dependence of Cavitation Erosion in Liquid Oxygen on Static Pressure"

Moscow, Akusticheskiy Zhurnal, Vol 17, No 4, 1971, pp 533—539

Abstract : A method and the installation for experimental investigation of the cavitation erosion of materials in liquid oxygen are described. The dependence of the erosion activity of acoustic cavitation in liquid oxygen (at 77.2 °K = boiling temperature of nitrogen used in the capacity of a cooling agent at atmospheric pressure) on static pressure and ultrasound frequency (15 and 35 kHz) were investigated. The investigation results are discussed by reference to diagrams showing the cavitation erosion, the maximum erosion depth of aluminum specimens, and the average diameter of the erosion zone as functions of static pressure and photographies of aluminum specimens eroded in oxygen. The results demonstrate that the erosion activity of acoustic cavitation in liquefied gases by constant electric power feeded into the transducer can be increased by many times by increase of static pressure. The erosion activity of cavitation decreases with increasing ultrasound frequency. Five illustr., 14 biblio. refs.

1/1

USSR

UDC 669.15.018.295

BOGACHEV, I. N., POTEKHIN, B. A., MASLAKOVA, T. M.

"Plasticity of Cast Martensite-Aging Cavitation-Resistant Stainless Steels"

Povysh. konstruktivn. prochnosti staley i splavov. No 2 -- V sb. (Improving the Structural Strength of Steels and Alloys. No 2 -- collection of works), Moscow, 1970, pp 54-57 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4I626)

Translation: The mechanical properties and cavitation resistance of steel with 12-13% Cr, 7-9.6% Ni, 0.02-0.05% C, Al, Ti, and Mo and also the presence of chemical inhomogeneities of the ingot were investigated. The results of the experiment permitted recommendation of these steels for use in shipbuilding, home construction, and hydraulic turbine construction.

1/1

USSR

UDC 669.15.018.44

BOGACHEV, I. N., MALINOV, L. S., EYSMONDT, T. D.

"Role of Martensitic Conversion During Deformation in Work Hardening Unstable Austenitic Steels"

Povysh. konstruktivn. prochnosti stalev i splavov. No 1 -- V sb. (Improving the Structural Strength of Steels and Alloys. No 1 — collection of works), Moscow, 1970, pp 126-129 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 41653

Translation: During deformation of unstable austenitic steel, martensitic conversion which hardens the steel still further takes place. The effect of plastic flow at various temperatures on the mechanical properties of OKh13AG8 and 30Kh10G10 steels was investigated. The expediency of using a number of successive deformations with intermediate heating to improve the properties of the steel was demonstrated.

1/1

USSR UDC 669.295:620.176.251.1:620.186.1

D'YAKOVA, M. A., BOGACHEV, I. N., BEZRUKOVA, A. K., and SELITSKAYA, S. I., Ural Polytechnical Institute

"Phase Conversions of Titanium Alloys at Low Temperatures"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 10, 1970, pp 36-38

Abstract: A study was made of the decomposition of the unstable β-solid solution of titanium alloys during cooling and plastic deformation at low temperatures. Two alloys were studied: one with 3.7% Al, 7.5% Mo (alloy A) with a temperature of beginning of martensite conversion of +50°C, and the other with a high content of the transitional elements (alloy B) with a temperature of beginning of martensite conversion of below -196°C. Exposure to cold increases the strength properties of both types of alloys. Plastic deformation at low temperatures results in the formation of deformation martensite and increases the yield point and ultimate strength.

1/1

USSR

UDC 536.425

BOGACHEV, I. N., and EYSMONDT, T. D., Ural Polytechnical Institute imeni S. M. Kirov

"Effect of Chromium on Phase Transformations and Strengthening of Type G13 and 30G10 Steels"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 30, No 6, Dec 70, pp 1213-1220

Abstract: A study was made of the effect of chromium (up to 16%) on the phase composition, martensite points, phase transformations, and strengthening during plastic deformation of unstable alloys (G13 and 30G10) which form both alpha- and epsilon-martensite. The steels were melted in an induction furnace and poured as blanks weighing 8 kg which were homogenized at 1200° C for 10 hours. After heat treating, the blanks were forged into rods which were austenitized at 1100° C (G13) and 1150° C (30G10) with subsequent water cooling. It was found that adding up to 16% Cr to 30G10 carbon steel significantly reduces the alpha-M_s point and degree of gamma-alpha transformation during cooling. Increased Cr content lowers the epsilon-M_s point and degree of gamma-epsilon transformation for both types of alloys. With a Cr content up to 16% in the 30G10 unstable austenitic

1/2

USSR

BOGACHEV, I. N., and EYSMONDT, T. D., Fizika Metallov i Metallovedeniye, Vol 30, No 6, Dec 70, pp 1213-1220

steel, the resistance of austenite to formation of alpha-martensite is increased under deformation. Stability of austenite to formation of epsilon-martensite varies in a more complex relationship. An increase in Cr content to 16% in steel G13, the structure of which is epsilon -+alpha+ gamma in the hardened state, leads to a lowering of the intensity of alpha-martensite formation and the intensity of the epsilon-phase under plastic deformation. In the investigated steels a transformation develops under deformation by the system gamma→epsilon→alpha. The increase in Cr content affects development of each of these types of transformations and, consequently, affects the ratio of phases formed as a result of plastic deformation.

2/2

USSR

UDC 539.376

POGACHEV, I. N., VEKSLER, YU. G., and SOROKIN, V. G., Sverdlovsk

"Study of Temporary Creep of Alloy OT-4 in High-Speed Air Flows in the Presence of Aerodynamic Oscillations"

Moscow, Izvestiya Akademii Nauk SSSR -- Metally, No 5, 1970, pp 137-142

Abstract: This article contains a description of a device and a procedure for determining the mechanical properties and erosion resistance of metallic materials in high-speed air flows. The role of the vibrations occurring in the samples under various test conditions is also analyzed.

The proposed procedure was used to estimate the properties of materials operating in contact with a high-speed gas or air flow, in particular, for materials subject to aerodynamic heating. Under these conditions, the materials are subject not only to static but also to variable stresses as a result of aerodynamic forces whose role and significance in creep resistance has not been studied. The variable stresses from the aerodynamic forces have a random nature and constitute a complicated complex with different frequency and ampliture which can vary within broad limits depending on the test conditions and the

USSR

BOGACHEV, I. N., et al, Izvestiya Akademii Nauk SSSR -- Metally, No 5, 1970, pp 137-142

properties of the material. OT-4 titanium alloy was used as the test material, and the tests were run in stationary air (M = 0) and in a high-speed air flow at M = 0.94, 1.3, and 1.6. The investigated temperature range was 475-600°C. The angle of attack was varied from 15 to 90°. A constant load of 8 kg/mm^2 was used in all cases. The oscillation frequency of the sample under all the test conditions in the high-speed air flow was within the limits of 2,300-2,600 per second. In the investigated temperature range all the creep curves for the high-speed air flow go higher than in the stationary air environment. The creep rate in the steady state stage in the air flow is higher in all cases, and its increase is sharper when the temperature is raised. The time before rupture is reduced sharply, and earlier occurrence of both the steady creep stage and the third creep stage is observed. The strain to rupture was reduced by approximately 3-4 times. Metallographic investigations showed that the development of rupture begins by the formation of erosion pitting basically along the grain boundaries, which with time form microcracks and pores. Final rupture occurs by selective rupture of the individual microvolumes of the alloy.

2/3

USSR

BOGACHEV, I. N., et al, Izvestiya Akademii Nauk SSSR -- Metally, No 5, 1970, pp 137-142

Results of a statistical study of the random stresses caused by aerodynamic oscillations of the samples under various test conditions are presented, and some laws of variation of the characteristics of the distribution as a function of the flow velocity, angle of attack, and temperature are revealed. It is pointed out that the effect of vibrations on the behavior of OT-4 alloy during creep is less significant than the corrosion-erosion effect of the high-speed air flow on the surface of the material.

3/3

USSR

UDC 620.193.5

BOGACHEV, I. N., VEKSLER, YU. G., and SOROKIN, V. G., Ural Polytechnical Institute imeni S. M. Kirov

"Interrelation Between Oxidation and Creep of Nickel, Cobalt and Iron"

Moscow, Zashchita Metallov, Vol 7, No 1, Jan-Feb 71, pp 28-31

Abstract: The authors studied the short-term creep of nickel, cobalt, and Armco iron in different environments (vacuum, air, high-speed airstream) at 650°. It was found that short-term creep characteristics depend significantly on the environment, the effect of which differs for the metals studied. Oxidation processes may increase or decrease creep resistance. The creep resistance of nickel is higher in air than in vacuum, that of iron much lower, while cobalt takes an intermediate position. The creep resistance of the metals, especially iron, is lower in high-speed airstreams than in a vacuum or a stationary air environment.

1/1

USSR

UDC 669.24:620.172.251.2

SOROKIN, V. G., BOGACHEV, I. N., VEKSLER, YU. G., LESNIKOV, V. P. and FILIPPOV, M. A.

"Short-Time Creep of Nickel in a High-Velocity Air Stream"

Moscow, Metallovedeniye i termicheskaya obrabotka metallov, No 3, 1970, pp 2-5

Abstract: Short-time creep of nickel in a vacuum, in a medium at rest, and in a high-speed air stream (M = 1.6) was experimentally investigated at 700-800°C under a stress of 2-4 kg/mm^2. Experiments were conducted on samples made of technically pure NP-I nickel in an aerodynamic wind tunnel intended for investigating tensile strength, short-time creep, and erosion resistance metals and alloys, at high temperatures and at air stream velocities up to Mach 4. The magnitude of deformation and time were counted from the time of sample heating up to a given temperature. The heating time was 30±5 sec. The results show that at 700-800°C the creep resistance of technically pure nickel in air is higher than in vacuum. In a high-velocity air stream the creep increases sharply as a result of the corrosion-erosion effect of the air stream. 2 figures, 1 table, 7 references.

1/1

1/2 022 UNCLASSIFIED PROCESSING DATE--02OCT70
TITLE--SHORT TERM CREEP OF NICKEL IN A HIGH SPEED AIR FLOW -U-

AUTHOR-(05)-SOROKIN, V.G., BOGACHEV, I.N., VEKSLER, YU.G., LESNEKOV, V.P.,
FILIPPOV, M.A.
COUNTRY OF INFO--USSR

SOURCE--METALLOVED. TERM. OBRAB. METAL. 1970, (3), 2-5

DATE PUBLISHED--------70

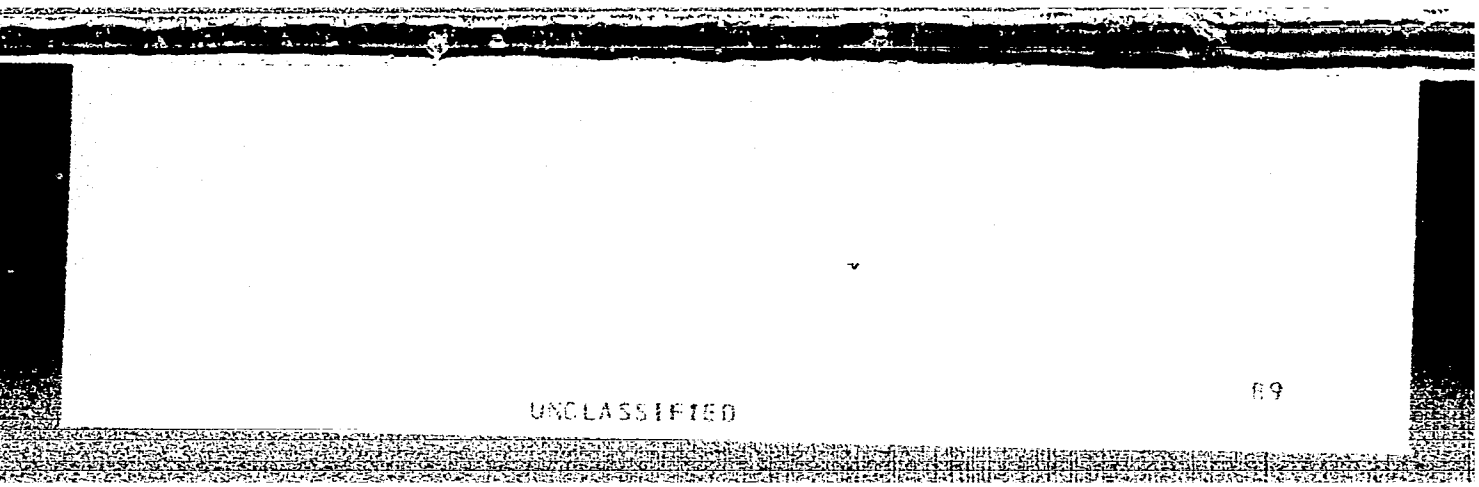
SUBJECT AREAS--MATERIALS

DISLOCATION PHENOMENON

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/1935 STEP NO--UR/0129/70/000/003/0002/0005

CIRC ACCESSION NO--AP0108264
UNCLASSIFIED



UDC 621.643.001.5

USSR

MANDEL'BERG, S. L., SEMENOV, S. YE., and BOGACHEK, YU. L., Institute of Electric Welding imeni Ye. O. Paton, Kiev

"Increasing the Impact Strength of Gas Pipe Weld Metal"

Moscow, Stroitel'stvo Truboprovodov, No 7, Jul 71, pp 23-26

Abstract: The article describes work performed at the Institute of Electric Welding imeni Ye. O. Paton to estimate the impact strength level of the weld metal of gas pipes and to determine ways of increasing it. Tests of expanded 17G1S steel pipes showed that the impact strength of the welds at -40° C was considerably less than for hot-straightened or thermally strengthened pipes. Low impact strength values are observed at -40 and -60° C right after welding. Expansion causes cold deformation of the metal, which produces an additional reduction in the impact strength of the welds. To increase the impact strength of the metal of the deformed welds, a more homogeneous structure with refined grains must be obtained. For expanded 17G1S steel pipes

1/2

USSR

MANDEL'BERG, S. L., et al., Stroitel'stvo Truboprovodov, No 7, Jul 71, pp 23-26

this can be done by using a special electrode wire alloyed with molybdenum and nickel (Sv-10NM or Sv-08KhN2M wire) in conjunction with a high-silica flux, as well as by postheating under normalization or temper quenching conditions.

2/2

USSR

UDC 621.372.54:621.316.925

SIROTA, I. M. and BOGACHENKO, A. Ye

"Band-Pass Filters for Relay Protection Devices"

Probl. tekhn. electrodinamiki. Resp. mezhved. sb. (Problems of Technical Electrodynamics. Republic Interdepartmental Collection) No 37, 1972, pp 40 - 50 (from RZh-Avtomatika Telemechanika i Vychislitel'naya Tekhnika, No 3, Mar 73, Abstract No 3 A344 by the authors)

Translation: The circuits considered are two-unit, L-shaped, LC voltage and current frequency filters. On the basis of quadripole theory, those relationships of the elements are found which will best tune out interference and yield the necessary output power from the filters for a voltage and current at 100 Hz. The parameters of filter elements which will satisfy the requirements of relay protection are selected. Seven illustrations, one table.

1/1

1/2 024 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--ESSENCE OF THE PATHOLOGICAL PROCESS IN CASES OF EPICONDYLITIS OF THE HUMERUS -U-

AUTHOR-(02)-ROMANOVSKIY, M.G., BOGACHENKO, N.I.

B

COUNTRY OF INFO--USSR

SOURCE--ORTOP TRAVMATOL PROT 31(2): 56-59, 1970

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--X RAY STUDY, BONE DISEASE, MUSCULOSKELETAL SYSTEM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605015/F06 STEP NO--UR/9115/70/031/002/0056/0059

CIRC ACCESSION NO--AP0140640

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--04DEC70

2/2 024
CIRC ACCESSION NO--AP0140640
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CLINICAL X RAY STUDIES WERE MADE OF 80 PATIENTS WITH EPICONDYLITIS AGED 26 TO 53 YR WITH DIFFERENT PHASES OF THE DISEASE. THESE STUDIES INDICATED THAT THE PATHOLOGICAL PROCESS IN EIPICONDYLITIS OF THE HUMERUS IN THE INITIAL PHASE IS PRIMARILY LOCALIZED AT THE SITE OF TRANSITION OF TENDON INTO THE BONE TISSUE OF THE EPICONDYLE. LATER, AS THE DISEASE DEVELOPS, SPREAD AND PENETRATION OF THE DEGENERATIVE DYSTROPHIC ALTERATIONS OCCURS WITH THE PRESENCE OF ASEPTIC INFLAMMATION IN THE MUSCLE TENDONS ATTACHED TO THE EPICONDYLE, IN THE PERIOSTEUM, BONY TISSUE, LIGAMENTS CONNECTED TO THE CAPSULE OF THE ELBOW JOINT, AND IN THE NERVES WHICH INNERVATE THE COMPONENTS OF THE ELBOW JOINT. WITH THE CLINICAL PROGRESSION OF THE DISEASE, DAMAGE TO NERVE FIBERS CAUSES THE CHARACTERISTIC PAIN SYNDROME DETECTED UPON EXAMINATION OF THE PATIENT. THE EPICONDYLE OF THE HUMERUS IS ONLY THE POINT AT WHICH THE PAIN IS LOCALIZED BY PROJECTION. THE CHANGES OCCURRING IN IT ARE A SECONDARY MANIFESTATION OF THE DISEASE. THEREFORE, THE TERM EPICONDYLITIS OF THE HUMERUS DOES NOT REFLECT THE ESSENCE OF THE DISEASE IN ALL ITS VARIEGATED CLINICAL MANIFESTATIONS, IT WOULD BE MORE CORRECT TO CALL IT PERIARTHRITIS OF THE ARTICULATIO
CUTIBI. FACILITY: KIEV INST. POSTGRAD. MED., KIEV, USSR.

UNCLASSIFIED

UDC: 621.374

USSR

BOGACHEV, A. I., ISAKOV, Yu. D., LYAPINSKIY, Yu. V., LYAPINSKIY, V. V., and KHORN, V. N.

"Method of Transforming Time Shift Between Pulses"

Moscow, Izmeritel'naya tekhnika, No 3, 1972, pp 52-54

Abstract: The necessity occasionally arises, in automatic control and computer engineering, to determine the time shift of one pulse train relative to another or to transform it linearly into pulse widths. A device for doing this is discussed in this article. A block diagram of the device is given and its operation explained, together with a timing diagram. Some details of the method of its testing are given. The device is subject to two types of error: one, in determining the the moment of passage of zero value of the sinusoidal signal; two, in the magnitude of the insensitivity zone. Advice in the reduction of these errors is provided. The instrument can be used in the mass production of functional elements.

USSR

UDC: 517.514

BOGACHEV, B. M.

"Weight Spaces with Various Weights with Respect to Various Variables"

Teoremy Vlozheniya i Ikh Prilozheniya [Imbedding Theorems and Their Applications--Collection of Works], Moscow, Nauka Press, 1970, pp 23-34, (Translated from Referativnyy Zhurnal Matematika, No 8, 1970, Abstract No 8B92, by the author).

Translation: A functional space with different weights for different directions is studied. The direct and inverse theorems of traces for one quadrant are proven.

1/1

USSR

UDC 669.245'71.017.3

ARKHANGEL'SKAYA, A. A., BOGACHEV, I. N., LITVINOV, V. S., and PANTSYREVA, Ye. G., Ural Polytechnic Institute imeni S. M. Kirov

"Phase Transformations in Nickel-Aluminum Alloys With Cesium Chloride Lattice"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 34, No 2, Aug 72, pp 541-546

Abstract: A study was made by metallographic, dilatometric, and roentgenostructural methods of the effects of the degree of nickel supersaturation on phase transformations during heating in substitutional Ni-Al-base solid solutions. The diffusionless transformation of a part of martensite into the β-phase in alloys with 65 and 66 at% Ni is accompanied by a separation of Ni_3Al dispersion particles. At the same time, a reduction of the specific volume of martensite and β-phase takes place. The transformation in the 240-360 deg. temperature interval results in intense hardening of the alloy: its microhardness increases up to 900 kg/mm^2. Analogous effects are observed for the 64% Ni-2% Co-34% Al and 64% Ni-2% Fe- 34% Al ternary alloys. It is supposed that volumetric changes accompanying the formation of martensite and its transformation during heating must affect the properties

1/2

USSR

ARKHANGEL'SKAYA, A. A., et al., Fizika Metallov i Metallovedeniye, Vol 34, No 2, Aug 72, pp 541-546

of coatings, particularly during repeated heating and cooling, develop microcracks in the protective coating, decay the heat-resistant oxide film, and intensify the diffusion processes in the coating. Three figures, one table, five bibliographic references.

UDC:669.245'71.017.3

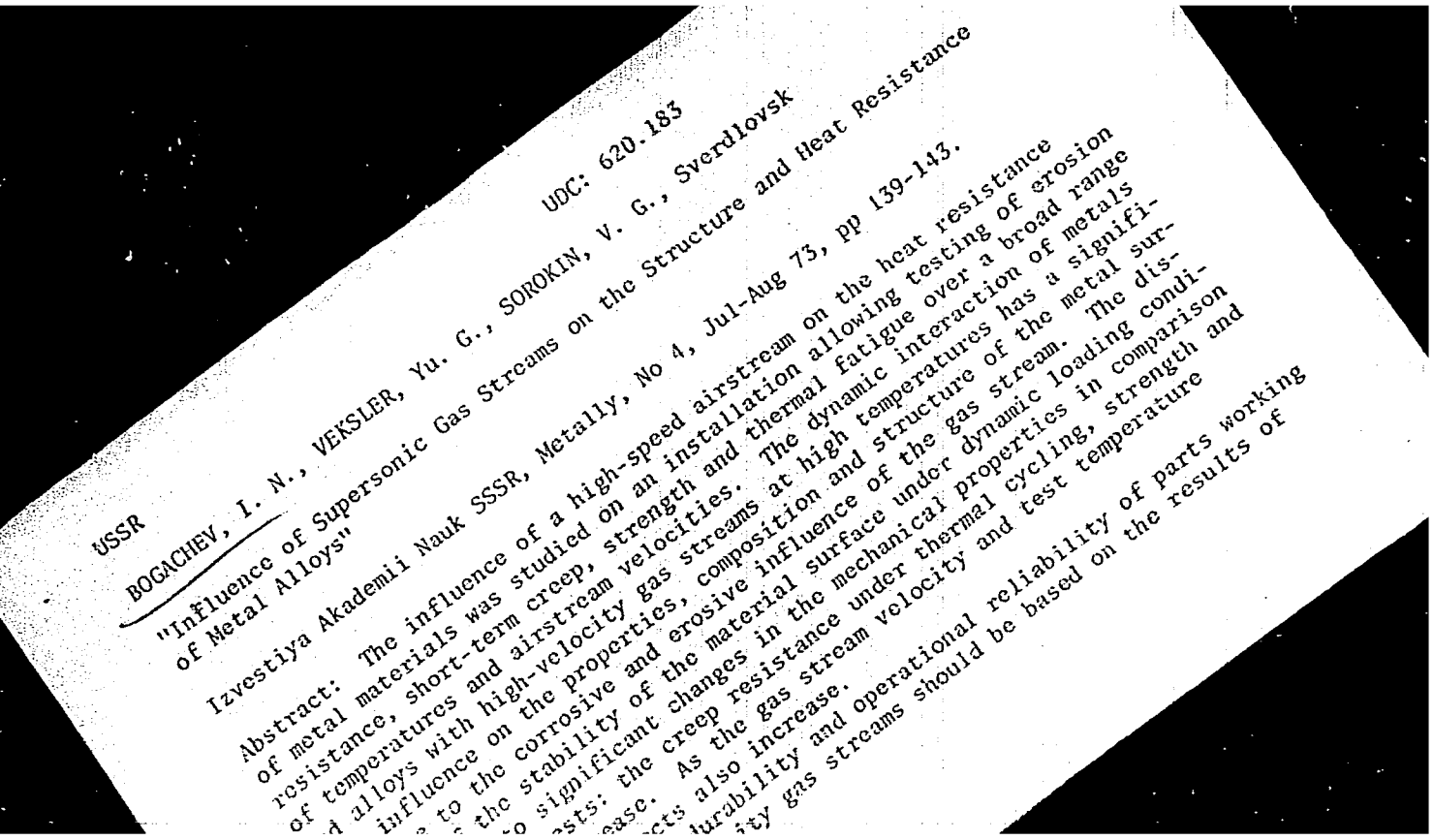
USSR

LITVINOV, V. S., BOGACHEV, I. N., ARKHANGEL'SKAYA, A. A., PANTSYREVA, Ye. G.,
Ural Polytechnic Institute imeni Kirov
"Electron Microscope Investigation of Nickel-Aluminum Alloy Martensite"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 36, No 2, 1973, pp 388-393

Abstract: The structure of the alloy 64 at.% Ni + 36 at.% Al, in which martensite conversion has occurred upon cooling from high temperatures (1200°C) at rates preventing separation of excess nickel, is studied by an electron-microscope method. It is shown that the martensite needles consist of thin plates in twin orientation in relation to each other with twinning planes in the set {101}. A β-phase shear plan is suggested, leading to the formation of such a martensite structure.

1/1



USSR

UDC: 620.183

BOGACHEV, I. N., VEKSLER, Yu. G., SOROKIN, V. G., Sverdlovsk

"Influence of Supersonic Gas Streams on the Structure and Heat Resistance of Metal Alloys"

Izvestiya Akademii Nauk SSSR, Metally, No 4, Jul-Aug 73, pp 139-143.

Abstract: The influence of a high-speed airstream on the heat resistance of metal materials was studied on an installation allowing testing of erosion resistance, short-term creep, strength and thermal fatigue over a broad range of temperatures and airstream velocities. The dynamic interaction of metals d alloys with high-velocity gas streams at high temperatures has a significluence on the properties, composition and structure of the metal surs to the corrosive and erosive influence of the gas stream. The dis- the stability of the material surface under dynamic loading condio significant changes in the mechanical properties in comparison sts: the creep resistance under thermal cycling, strength and ease. As the gas stream velocity and test temperature cts also increase. durability and operational reliability of parts working ity gas streams should be based on the results of

UDC: 620.183

USSR

BOGACHEV, I. N., VEKSLER, Yu. G., SOROKIN, V. G., Sverdlovsk

"Influence of Supersonic Gas Streams on the Structure and Heat Resistance of Metal Alloys"

Izvestiya Akademii Nauk SSSR, Metally, No 4, Jul-Aug 73, pp 139-143.

Abstract: The influence of a high-speed airstream on the heat resistance of metal materials was studied on an installation allowing testing of erosion resistance, short-term creep, strength and thermal fatigue over a broad range of temperatures and airstream velocities. The dynamic interaction of metals and alloys with high-velocity gas streams at high temperatures has a significant influence on the properties, composition and structure of the metal surface due to the corrosive and erosive influence of the gas stream. The disruption of the stability of the material surface under dynamic loading conditions leads to significant changes in the mechanical properties in comparison with standard tests: the creep resistance under thermal cycling, strength and ductility all decrease. As the gas stream velocity and test temperature increases, these effects also increase.

Prediction of the durability and operational reliability of parts working in contact with high velocity gas streams should be based on the results of

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002200410020-0"

USSR

Bogachev, I. N., Veksler, Yu. G., Sorokin, V. G., Izvestiya Akademii Nauk SSSR, Metally, No 4, Jul-Aug 73, pp 139-143.

determination of mechanical characteristics under conditions as close as possible to usage conditions.

USSR UDC 537.533:54

BOGACHEV, I. N., KUDARAUSKAS, I. A., and KUZNETSOV, V. O., Ural Polytechnical Institute imeni C. M. Kirov, Sverslovsk

"Effect of Adsorption on Kinetics of the Exoelectronic Emission"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 47, No 6, Jun 73, pp 1578-1579

Abstract: Exoemission of tin and zinc subjected to deformation by tension and rupture under vacuum (up to $2 \cdot 10^{-6}$ torr) was studied. The emission was stimulated by a mercury lamp, the rate of deformation was $4.24 \cdot 10^{-4}$ sec^{-1}. The experiment was based on the cyclic increase of pressure in vacuum from $2 \cdot 10^{-6}$ to $5 \cdot 10^{-4}$ torr. After rupturing the tin samples at $5 \cdot 10^{-4}$ torr some increase in emission was observed, followed by a gradual decrease in the emission intensity. When the vacuum was increased twofold, the emission at first decreased, then reached a maximum and decreased again. Similar phenomena were observed in the case of zinc, but decreases and increases were of much high magnitude. This behavior of emission is attributed to adsorption processes. Filling the vacuum chamber with air to $5 \cdot 10^{-4}$ torr pressure facilitated the adsorption process and it was accompanied by an intensive exoemission. If samples were held at this pressure for ~ 1 min., several increases and decreases in the exoemission were observed. However, during

1/2

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002200410020-0"

USSR

BOGACHEV, I. N., et al., Zhurnal Fizicheskoy Khimii, Vol 47, No 6, Jun 73, pp 1578-1579

the second increase in pressure, the kinetics of exoemission was not influenced much in the case of zinc but facilitated a more rapid decrease of the exoemission for tin. This indicated the irreversible nature of the emission process.

2/2

UDC 669.14.018.2

USSR

BOGACHEV, I. N.

Kavitatsionnoye Razrusheniye i Kavitatsionnostoykiye Splavy (Cavitation Failure and Cavitation-Resistant Alloys), Moscow, Metallurgiya, 1972, 192 pp

Translation of Introduction: One of the important problems of the modern science of metals is increasing the service life of machine parts and mechanisms. The solution of the problem is more complex each year owing to the fact that for new machines, forced modes of operation, increased capacities, speeds, and operating temperatures are specified. Conditions of loading are likewise complicated and impulse, vibration, and impact loads are increased.

Failure of parts and assemblies in many cases starts at the surface layers. Historically, contact failure during friction and wear, i.e., in metal-metal contact, has been the first thing studied in the overall problem of strength. As a result, various ideas have developed regarding the relationship of structure and strength of the surface layer to the wear resistance of metal parts.

1/6

USSR

BOGACHEV, I. N., Kavitatsionnoye Razrusheniye i Kavitatsionnostoykiye Splavy, Metallurgiya, 1972, 192 pp

The physical state of the surface, microgeometry, strength, and nature of hardening under contact loading take on special significance under conditions of contact loading. In essence, a new field of metal science is being created in which surface layers are the topic of investigation.

The concept of contact and contact surface means the perception of large loads localized in small volumes and characterized by frequency and dynamics of their application.

Contact surfaces can be different: contact of solids (friction and wear), solid-liquid contact (cavitation, cavitation erosion), and solid-gas contact (gas erosion). The complication of contact loading can be associated with a series of secondary phenomena including change of temperature, oxidation, and the formation of electrical and other phenomena. In spite of the different forms of contacting media, in the kinetics and mechanism of metal surface failure, much can be observed overall and, therefore, failure in contact with one or another medium can be examined as the partial case of contact strength.

2/6

USSR

BOGACHEV, I. N., Kavitatsionnoye Razrusheniye i Kavitatsionnostoykiye Splavy, Metallurgiya, 1972, 192 pp

Information and data are presented in this book on the failure of metals during the cavitation action of liquid (water) flow. This field is of substantial interest in hydraulic machine building (turbines, pumps) and other branches of the national economy (screw shafts, engine casings, etc.).

Cavitation erosion removes metal as much as corrosion does; thus it can be seen that much importance attaches to the problem of increasing cavitation resistance in order to reduce large losses of metal and to increase the service life of parts in hydraulic machine building.

Over the years the Problem Laboratory of Metal Science of the Ural Polytechnic Institute imeni S. M. Kirov has developed general principles for the selection of cavitation-resistant steels and the practical application of these steels to the development of new cavitation-resistant steels having better properties than existing steels. As a result of research, a number of high-strength steels have been proposed. This book presents the works of personnel of the aforementioned laboratory, done under the author's supervision.

3/6

USSR

BOGACHEV, I. N., Kavitatsionnoye Razrusheniye i Kavitatsionnostoykiye Splavy, Metallurgiya, 1972, 192 pp

In the study and development of Cr-Mn steels, L. S. Malinov, T. M. Maslakova, R. I. Mints, and T. D. Eysmondt participated. L. S. Malinov, T. M. Maslakova, B. A. Potekhin, N. V. Zvigintsev, and V. A. Strizhak were involved in the development of cast maraging steels. Undergraduate and graduate students of the Department of Heat Treatment and Metal Physics also took part in the research.

V. P. Korobeynikov, L. I. Lepekhina, and T. M. Maslakova prepared the manuscript for print.

Table of Contents:

4/6

USSR

BOGACHEV, I. N., Kavitatsionnoye Razrusheniye i Kavitatsionnostoykiye Splavy, Metallurgiya, 1972, 192 pp

USSR

BOGACHEV, I. N., Kavitatsionnoye Razrusheniye i Kavitatsionnostoykiye Splavy, Metallurgiya, 1972, 192 pp

Rolling Steel

UDC 669.15669.017.25539.4

EFFECT OF WARM ROLLING ON THE MECHANICAL PROPERTIES OF UNSTABLE CHROMIUM-MANGANESE AUSTENITIC STEEL

[Article by [illegible] N. Bogachev, T. D. Eymontt, A. V. Fugman, Ural Polytechnic Institute imeni S. M. Kirov, Moscow, Fizika metallov i metallovedeniye, Russian, Vol 34, No 5, 1962, submitted 8 October 1971, pp 1034-1041]

A study was made of the possibility of increasing the set of mechanical properties of unstable chromium-manganese austenitic steel by deformation in the 300-500° C range. Along with an increase in the strength properties, the warm rolling leads to an increase in the plastic properties of the steel with active development of martensitic conversion with deformation. This is connected with stabilization of the austenite with respect to phase transformations. After warm rolling the amount of alpha-phase in the test process increases gradually with an increase in the degree of deformation which insures good plasticity of these steels.

Warm deformation is widely used for strengthening austenitic steel [1-3]. The majority of studies in this area have been made on chromium-nickel steel. In this paper a study has been made of the effect of warm rolling in the temperature range of 300-550° on the mechanical properties of unstable austenitic chromium-manganese steel. The level of the mechanical properties (σ_B, δ) of the unstable austenitic steels depends to a high degree on the intensity of development of the martensitic conversion during testing. Accordingly, a study is made of the effect of the temperature and degree of preliminary deformation on the development of the martensitic γ→α transformations with subsequent deformation.

Experimental Data and Procedure

A study is made of the steel having different stability of the austenite, the content of carbon and the content of the carbide-forming element -- chromium (Table 1).

B06AcHEV, I.N.

Table 1

Type of steel	C	Cr	Mn	Si	S	P
30Kh2G10	0.30	2.20	10.55	0.38	—	0.0001
30Kh16G10	0.32	16.50	10.36	0.14	0.(00)	—
47Kh10G8	0.47	9.81	7.50	0.35	—	—
60G7	0.60	0.81	6.61	0.10	—	—
20Kh10G10	0.20	11.00	10.10	0.25	0.005	0.005

The steel was made in an induction furnace. After homogenizing annealing, the ingots weighing 8 kg were forged into bars which went through the austenizing stage at 1,100° with subsequent cooling in water. The deformation was realized by rolling on a roll pass mill in the 300-550° range. The heating of the specimens to the deformation temperature and heating them during rolling took place in a salt bath. The billets 10 x 10 mm in cross section were rolled, then specimens were made from them for mechanical testing.

The effect of the temperature and degree of preliminary deformation on the development of the γ→α transformations during subsequent deformation was studied on a 20Kh10G10 steel wire. The deformation was realized by swaging.

The amount of α-phase formed during deformation was determined using the Shteynberg-Zyuzin ballistic magnetometer. An armco iron sample was used as the standard. The effect of the alloying elements on the magnetic saturation of the investigated steel was considered for the calculation. The relative α-phase content was estimated by varying the density ρ/ρ as a result of the γ→α transformation [4]. The mechanical properties were determined using specimens 3 mm in diameter and with l_0 = 20 mm on the IM-4R machine.

Results and Discussion of the Results

The amount of α-martensite formed in the steel during plastic flow by torsion is illustrated in figure 1. For steel with 0.3 percent C (30Kh2G10 and 30Kh16G10) an increase in the chromium content leads to stabilization of the austenite with respect to γ→α conversion during deformation. Thus, after deformation in 30Kh2G10 steel, 29 percent α-phase is formed; in 30Kh16G10 steel, 1 percent. Torsion fracture of 30Kh2G10 steel with intense deformation takes place at 17 percent deformation; for 30Kh16G10 steel in which the amount of α-phase gradually increases with an increase in the degree of deformation it takes place at 40 percent. The mechanical properties of this steel after quenching and preliminary warm rolling are presented in Table 2.

The increase in chromium content in steel with 0.3 percent C somewhat exceeds the yield point of $\sigma_{0.2}$ after quenching (from 41 to 46.2 kg/mm^2); the ultimate strength σ_B increases sharply in this case: from 57.7 kg/mm^2 for 30Kh2G10 steel to 97.1 kg/mm^2 for 30Kh16G10 steel. The formation of a large amount of deformation martensite in the first steel during mechanical testing

USSR

UDC 669.1:620.193.91

BOGACHEV, I. N., ZVIGINTSEV, N. V., and MASLAKOVA, T. M., Ural Polytechnic Institute imeni S. M. Kirov

"Effect of Alloying on the Aging Process and Strengthening of Steel with 20% Nickel"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 33, No 2, Feb 72, pp 362-368

Abstract: The effect of alloying elements on the processes of aging and strengthening was studied according to the change in hardness and a number of physical properties: thermal emf and electrical resistance. The alloys studied were : N20, N20M2, N20M5, N20K10, N20K15, N20K10M5, N20K10M5TYu, N20TYu, and N20M3TYu. An aging temperature between 400 and 550° C produced the highest hardnesses and it was found that Fe-Ni steels N20K10M5, N20Tyu, N20M3TYu, and N20K10M5TYu were much harder than steels N20, N20M2, N20K10, N20K15 and N20M5, which is explained for the most part by their content of titanium and aluminum. On the other hand the harder steels had a lower thermal emf. It was concluded that the processes of aging and strengthening of precipitation hardened Fe-Ni steels was dependent on the content of Mo, Ti, Al, and Co although the effect of these elements differed for the indicated processes. Anomalies in the temperature relationship of the physical properties, dependent on Co and Mo, are weakened by Ti and Al. Four figures, 1 table, 14 bibliographic references.

1/1

USSR UDC 669.295

BOGACHEV, I. N., DAVYDOV, V. N. and KOROBEYNIKOV, V. P.

"Removal of Scale From the Surface of Titanium Alloys Using Cavitation Treatment"

Moscow, Tsvetnyye metally, No 1, Jan 72, pp 77-78

Abstract: Described is a feasibility study on the use of ultrasonic cavitation treatment of the surface of titanium alloy sheets for either partial or complete removal of scale exclusive of the shortcomings of other methods. It is shown that preliminary loosening-up of the difficult-to-remove scale from titanium alloys by ultrasonic cavitation treatment in water reduces the subsequent pickling time 30 to 40 times, which significantly reduces the degree of hydrogenation of alloys in the process of pickling and thus improves the surface quality of the sheet material, without affecting its basic mechanical properties. The experimental materials were VT6s and VT14 hot-rolled titanium stock. A diagram of the experimental ultrasonic unit for the cavitation treatment of the surface of sheet metal specimens is shown. The subsequent chemical pickling was performed in an aqueous solution of 15% H_2SO_4 and 2% NH_4F at 20°C. The specimens were rinsed in running water for 15-20 sec. (1 illustration; 3 bibliographic references).

1/1

UDC 534.29;532.528

USSR

BOGACHEV, I. N., and KOROBEYNIKOV, V. P., Ural Polytechnic Institute imeni S. M. Kirov, Sverdlovsk

"Intensity Dependence of Cavitation Erosion in Liquid Oxygen on Static Pressure"

Moscow, Akusticheskiy Zhurnal, Vol 17, No 4, 1971, pp 533-539

Abstract : A method and the installation for experimental investigation of the cavitation erosion of materials in liquid oxygen are described. The dependence of the erosion activity of acoustic cavitation in liquid oxygen (at 77.2 °K = boiling temperature of nitrogen used in the capacity of a cooling agent at atmospheric pressure) on static pressure and ultrasound frequency (15 and 35 kHz) were investigated. The investigation results are discussed by reference to diagrams showing the cavitation erosion, the maximum erosion depth of aluminum specimens, and the average diameter of the erosion zone as functions of static pressure and photographies of aluminum specimens eroded in oxygen. The results demonstrate that the erosion activity of acoustic cavitation in liquefied gases by constent electric power feeded into the transducer can be increased by many times by increase of static pressure. The erosion activity of cavitation decreases with increasing ultrasound frequency. Five illustr., 14 biblio. refs.

UDC 534.133

USSR

UDC 669.15.018.295

BOGACHEV, I. N., POTEKHIN, B. A., MASLAKOVA, T. M.

"Plasticity of Cast Martensite-Aging Cavitation-Resistant Stainless Steels"

Povysh. konstruktivn. prochnosti staley i splavov. No 2 -- V sb. (Improving the Structural Strength of Steels and Alloys. No 2 -- collection of works), Moscow, 1970, pp 54-57 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4I626)

Translation: The mechanical properties and cavitation resistance of steel with 12-13% Cr, 7-9.6% Ni, 0.02-0.05% C, Al, Ti, and Mo and also the presence of chemical inhomogeneities of the ingot were investigated. The results of the experiment permitted recommendation of these steels for use in shipbuilding, home construction, and hydraulic turbine construction.

1/1

UDC 669.15.018.44

USSR

BOGACHEV, I. N., MALINOV, L. S., EYSMONDT, T. D.

"Role of Martensitic Conversion During Deformation in Work Hardening Unstable Austenitic Steels"

Povysh. konstruktivn. prochnosti staley i splavov. No 1 -- V sb. (Improving the Structural Strength of Steels and Alloys. No 1 -- collection of works), Moscow, 1970, pp 126-129 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 41653

Translation: During deformation of unstable austenitic steel, martensitic conversion which hardens the steel still further takes place. The effect of plastic flow at various temperatures on the mechanical properties of OKh13AG8 and 30Kh10G10 steels was investigated. The expediency of using a number of successive deformations with intermediate heating to improve the properties of the steel was demonstrated.

1/1

USSR

UDC 669.295:620.176.251.1:620.186.1

D'YAKOVA, M. A., BOGACHEV, I. N., BEZRUKOVA, A. K., and SELITSKAYA, S. I.,
Ural Polytechnical Institute

"Phase Conversions of Titanium Alloys at Low Temperatures"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 10, 1970, pp 36-38

Abstract: A study was made of the decomposition of the unstable β-solid solution of titanium alloys during cooling and plastic deformation at low temperatures. Two alloys were studied: one with 3.7% Al, 7.5% Mo (alloy A) with a temperature of beginning of martensite conversion of +50°C, and the other with a high content of the transitional elements (alloy B) with a temperature of beginning of martensite conversion of below -196°C. Exposure to cold increases the strength properties of both types of alloys. Plastic deformation at low temperatures results in the formation of deformation martensite and increases the yield point and ultimate strength.

1/1

UDC 536.425

USSR

BOGACHEV, I. N., and EYSMONDT, T. D., Ural Polytechnical Institute imeni S. M. Kirov

"Effect of Chromium on Phase Transformations and Strengthening of Type G13 and 30G10 Steels"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 30, No 6, Dec 70, pp 1213-1220

Abstract: A study was made of the effect of chromium (up to 16%) on the phase composition, martensite points, phase transformations, and strengthening during plastic deformation of unstable alloys (G13 and 30G10) which form both alpha- and epsilon-martensite. The steels were melted in an induction furnace and poured as blanks weighing 8 kg which were homogenized at 1200° C for 10 hours. After heat treating, the blanks were forged into rods which were austenitized at 1100° C (G13) and 1150° C (30G10) with subsequent water cooling. It was found that adding up to 16% Cr to 30G10 carbon steel significantly reduces the alpha-M_s point and degree of gamma-alpha transformation during cooling. Increased Cr content lowers the epsilon-M_s point and degree of gamma-epsilon transformation for both types of alloys. With a Cr content up to 16% in the 30G10 unstable austenitic

1/2

USSR

BOGACHEV, I. N., and EYSMONDT, T. D., Fizika Metallov i Metallovedeniye, Vol 30, No 6, Dec 70, pp 1213-1220

steel, the resistance of austenite to formation of alpha-martensite is increased under deformation. Stability of austenite to formation of epsilon-martensite varies in a more complex relationship. An increase in Cr content to 16% in steel G13, the structure of which is epsilon -+alpha+ gamma in the hardened state, leads to a lowering of the intensity of alpha-martensite formation and the intensity of the epsilon-phase under plastic deformation. In the investigated steels a transformation develops under deformation by the system gamma→epsilon→alpha. The increase in Cr content affects development of each of these types of transformations and, consequently, affects the ratio of phases formed as a result of plastic deformation.

2/2

USSR

UDC 539.376

BOGACHEV, I. N., VEKSLER, YU. G., and SOROKIN, V. G., Sverdlovsk

"Study of Temporary Creep of Alloy OT-4 in High-Speed Air Flows in the Presence of Aerodynamic Oscillations"

Moscow, Izvestiya Akademii Nauk SSSR -- Metally, No 5, 1970, pp 137-142

Abstract: This article contains a description of a device and a procedure for determining the mechanical properties and erosion resistance of metallic materials in high-speed air flows. The role of the vibrations occurring in the samples under various test conditions is also analyzed.

The proposed procedure was used to estimate the properties of materials operating in contact with a high-speed gas or air flow, in particular, for materials subject to aerodynamic heating. Under these conditions, the materials are subject not only to static but also to variable stresses as a result of aerodynamic forces whose role and significance in creep resistance has not been studied. The variable stresses from the aerodynamic forces have a random nature and constitute a complicated complex with different frequency and amplitude which can vary within broad limits depending on the test conditions and the

1/3

USSR

BOGACHEV, I. N., et al, Izvestiya Akademii Nauk SSSR -- Metally, No 5, 1970, pp 137-142

properties of the material. OT-4 titanium alloy was used as the test material, and the tests were run in stationary air (M = 0) and in a high-speed air flow at M = 0.94, 1.3, and 1.6. The investigated temperature range was 475-600°C. The angle of attack was varied from 15 to 90°. A constant load of 8 kg/mm^2 was used in all cases. The oscillation frequency of the sample under all the test conditions in the high-speed air flow was within the limits of 2,300-2,600 per second. In the investigated temperature range all the creep curves for the high-speed air flow go higher than in the stationary air environment. The creep rate in the steady state stage in the air flow is higher in all cases, and its increase is sharper when the temperature is raised. The time before rupture is reduced sharply, and earlier occurrence of both the steady creep stage and the third creep stage is observed. The strain to rupture was reduced by approximately 3-4 times. Metallographic investigations showed that the development of rupture begins by the formation of erosion pitting basically along the grain boundaries, which with time form microcracks and pores. Final rupture occurs by selective rupture of the individual microvolumes of the alloy.

2/3

USSR

BOGACHEV, I. N., et al, Izvestiya Akademii Nauk SSSR -- Metally, No 5, 1970, pp 137-142

Results of a statistical study of the random stresses caused by aerodynamic oscillations of the samples under various test conditions are presented, and some laws of variation of the characteristics of the distribution as a function of the flow velocity, angle of attack, and temperature are revealed. It is pointed out that the effect of vibrations on the behavior of OT-4 alloy during creep is less significant than the corrosion-erosion effect of the high-speed air flow on the surface of the material.

3/3

USSR

UDC 620.193.5

BOGACHEV, I. N., VEKSLER, YU. G., and SOROKIN, V. G., Ural Polytechnical Institute imeni S. M. Kirov

"Interrelation Between Oxidation and Creep of Nickel, Cobalt and Iron"

Moscow, Zashchita Metallov, Vol 7, No 1, Jan-Feb 71, pp 28-31

Abstract: The authors studied the short-term creep of nickel, cobalt, and Armco iron in different environments (vacuum, air, high-speed airstream) at 650°. It was found that short-term creep characteristics depend significantly on the environment, the effect of which differs for the metals studied. Oxidation processes may increase or decrease creep resistance. The creep resistance of nickel is higher in air than in vacuum, that of iron much lower, while cobalt takes an intermediate position. The creep resistance of the metals, especially iron, is lower in high-speed airstreams than in a vacuum or a stationary air environment.

1/1

USSR

UDC 669.24:620.172.251.2

SOROKIN, V. G., BOGACHEV, I. N., VEKSLER, YU. G., LESNIKOV, V. P. and FILIPPOV, M. A.

"Short-Time Creep of Nickel in a High-Velocity Air Stream"

Moscow, Metallovedeniye i termicheskaya obrabotka metallov, No 3, 1970, pp 2-5

Abstract: Short-time creep of nickel in a vacuum, in a medium at rest, and in a high-speed air stream (M = 1.6) was experimentally investigated at 700-800°C under a stress of 2-4 kg/mm^2. Experiments were conducted on samples made of technically pure NP-I nickel in an aerodynamic wind tunnel intended for investigating tensile strength, short-time creep, and erosion resistance metals and alloys, at high temperatures and at air stream velocities up to Mach 4. The magnitude of deformation and time were counted from the time of sample heating up to a given temperature. The heating time was 30±5 sec. The results show that at 700-800°C the creep resistance of technically pure nickel in air is higher than in vacuum. In a high-velocity air stream the creep increases sharply as a result of the corrosion-erosion effect of the air stream. 2 figures, 1 table, 7 references.

1/1

1/2 022 UNCLASSIFIED PROCESSING DATE--020CT70

TITLE--SHORT TERM CREEP OF NICKEL IN A HIGH SPEED AIR FLOW -J-

AUTHOR-(05)-SOROKIN, V.G., BOGACHEV, I.N., VEKSLER, YU.G., LESNIKOV, V.P., FILIPPOV, M.A.

COUNTRY OF INFO--USSR

SOURCE--METALLOVED. TERM. OBRAB. METAL. 1970, (3), 2-5

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--NICKEL, CREEP RESISTANCE, AIR FLOW, OXIDE FILM, CRYSTAL DISLOCATION PHENOMENON

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1989/1935 STEP NO--UR/0129/70/000/003/0002/0005

CIRC ACCESSION NO--AP0108264

UNCLASSIFIED

2/2 022 UNCLASSIFIED PROCESSING DATE--020CT70

CIRC ACCESSION NO--AP0108264

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AT 700-8000EGREES THE RESISTANCE TO CREEP OF TECHN. PURE NI IS HIGHER WHEN TESTED IN AIR THAN WHEN TESTED IN VACUUM. THIS IS DUE TO THE STRENGTHENING INFLUENCE OF AN OXIDE FILM WHICH PREVENTS THE EMERGENCE OF DISLOCATIONS ONTO THE FREE SURFACE. IN A FAST AIR FLOW THE CREEP OF NI IS STRONGTLY ENHANCED BY THE CORROSIVE EROSIVE ACTION. THE TIME TO RUPTURE IS SHORTENED.

89

UNCLASSIFIED

B

UDC: 669.14.018.45:620.193

USSR

GOLUBEV, V. I., BOGACHEV, I. N., and VEKSLER, Yu. G., Ural Polytechnic Institute

"Study of the Cavitation-Erosion Resistance of Stainless and Heat-Resisting Steels in Lead-Bismuth Melts"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya, No 8, 70, pp 123-126

Abstract: The objective of this study was to assess the effect of Si and Mo on the cavitation and erosion resistance of austenitic stainless steels in Pb-Bi melts as compared to 1Kh18N10T and Kh18N14 steels without additional alloying, as well as the effect of heat treatment on the stability of heat-resisting steels. It was found that the cavitation and erosion resistance of steels and alloys in Pb-Bi melts is determined by their chemical composition and the method of heat treatment Cavitation and erosion failure of the metal's surface occurs following deformation and strengthening. The subsequent softening caused by internal ruptures in the grain, cracks, and separation of individual microvolumes sets in when the metal's ability to strengthen is exhausted. The addition of Si and Mo, alone with increasing the heat resistance, corrosion resistance, and plastic and strength limits, increases the resistance to plastic deformation of the surface layers on exposure to cavitation. The decrease in the resistance of steel in bismuth-rich melts is proportional to both the extent and depth of the strengthened zone.

1/2 029 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--EFFECT OF ALLOYING ELEMENTS ON THE SPECIFIC ELECTRIC RESISTANCE OF IRON MANGANESE AUSTENITE DURING ANTIFERROMAGNETIC TRANSFORMATION -U-

AUTHOR-(03)-BOGACHEV, I.N., YEGOLAYEV, V.F., EFROS, B.M.

B

COUNTRY OF INFO--USSR

SOURCE--FIZ. METAL. METALLOVED. 1970, 29(2), 424-6

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS, MATERIALS

TOPIC TAGS--CONDUCTION ELECTRON, RESISTIVITY, ANTIFERROMAGNETISM, ALLOY COMPOSITION, AUSTENITE, IRON ALLOY, MANGANESE ALLOY, MAGNETIC TRANSFORMATION, TEMPERATURE DEPENDENCE, NICKEL, CHROMIUM, SILICON, ALLOY ADDITIVE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3003/0356 STEP NO--UR/0126/70/029/002/0424/0426

CIRC ACCESSION NO--AP0129588
UNCLASSIFIED

2/2 029 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0129588

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECTS OF NI, CR, AND SI ON THE ANTIFERROMAGNETIC TRANSFORMATION OF FE-MN AUSTENITE WAS STUDIED, USING THE G40 (40PERCENT MN) ALLOYS AS AN EXAMPLE, BY THE ELEC. RESISTANCE METHOD. THESE ELEMENTS LOWER THE NEEL POINT AND AFFECT THE ANOMALIES IN THE SP. RESISTANCE IN THE TRANSFORMATION. THE RESISTANCE WAS DETD. AT 77-800DEGREESK FOR ALLOYS CONTG. 4-10PERCENT BY WT. NI, 2.0-10.3PERCENT CR, OR 0.12-2.00PERCENT SI. THE RELATIVE CHANGE IN THE RESISTANCE BECAUSE OF THE ANTIFERROMAGNETIC ORDERING IS CHARACTERIZED BY A FACTOR, D. THE TEMP. DEPENDENCE OF D SHOWS THAT SI AND NI HAVE THE GREATEST EFFECTS; THIS IS ATTRIBUTED TO A DECREASE IN THE EFFECTIVE NO. OF CONDUCTION ELECTRONS. FACILITY: URAL. POLITEKH. INST. IM. KIROVA, SVERDLOVSK, USSR.

UNCLASSIFIED

Analysis and Testing

B

UDC 620.10:539.376

USSR

BOGACHEV, I. N., VEKSLER, YU. G., and SOROKIN, V. G., Ural Polytechnical Institute

"Short-Lived Creep of Metals and Alloys under Aerodynamic Heating"

Moscow, IVUZ Chernaya Metallurgiya, No 4, 1970, pp 142-147

Translation: A description is given of short-lived creep tests on metals and alloys under conditions of dynamic contact with high-speed air flows. A device was used which permitted the tests to be conducted in a broad range of temperatures and loads. Short-lived creep testing of nickel, cobalt, armco iron, alloys OT-4, VZh-98, and E143B, and steel Kh18N9T in the temperature interval from 500 to 1000°C shows that the characteristics of creep during tests in high-speed air flows differ considerably from analogous characteristics obtained under static conditions. Their changes are related to the thermal and corrosion-erosion action of the flow as well as to varying stresses which originate in the sample under the effect of aerodynamic forces.

1/1

USSR

UDC 669.24:620.17

BOGACHEV, I. N., VEKSLER, YU. G., SEGAL', V. M., and SOROKIN, V. G., Ural Polytechnical Institute imeni S. M. Kirov

"Mechanism of Deformation of Nickel Surface in High-Velocity Air Streams"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 29, No 6, Jun 70, pp 1210-1214

Abstract: A study is made of the fine structure of nickel tested on an aerodynamic device at an air flow velocity of 1.6 M in a broad range of temperatures and testing times. At low testing temperatures, a considerable increase in the density of imperfections of the crystal lattice is observed, and grain crushing takes place on the surface of the specimen. The structure contains a large quantity of erosion pittings, and deformations, according to the shape of the slip trace, occur nonuniformly in the metal. With an increase in the testing temperature, the material hardens primarily because of intensive breaking down of grains, and with an increase in the time of dynamic recovery takes place which may lead to a recovery of the deformed material. An increased testing temperature is followed by a high rate of recovery and by a recrystallization of the deformed layer. A qualitative model of the flow of the processes of hardening-recovery in the surface layers of nickel during its deformation in a high-speed air stream is presented.
The authors thank R. S. Shklyar for valuable discussion of the results of the work.
1/1

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002200410020-0"

1/2 041 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--CONCENTRATION DEPENDENCE OF PHYSICAL PROPERTY ANOMALIES DURING ANTIFERROMAGNETIC TRANSFORMATION IN IRON MANGANESE ALLOYS -U-

AUTHOR-(03)-BOGACHEV, I.N., YEGOLAYEV, V.F., FROLOVA, T.L.

B

COUNTRY OF INFO--USSR

SOURCE--FIZ. METAL METALLOVED. 1970, 29(2), 358-63

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--PHYSICAL PROPERTY, MANGANESE ALLOY, AUSTENITE, FERROMAGNETIC MATERIAL, ANTIFERROMAGNETIC MATERIAL, NEEL TEMPERATURE, ELASTIC MODULUS, MAGNETIC STRUCTURE, INTERNAL FRICTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1998/0935 STEP NO--UR/0126/70/029/002/0358/0363

CIRC ACCESSION NO--AP0121537

UNCLASSIFIED

2/2 041 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0121537

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ANOMALIES WERE STUDIED DURING THE ANTIFERROMAGNETIC TRANSFORMATION INTO AUSTENITE FOR ALLOYS CONTG. 14-38PERCENT BY WT. MN. THE ALLOYS CONTG. LESS THAN 27PERCENT BY WT. MN WERE SUBJECTED TO STABILIZING TREATMENT TO AVOID THE EFFECT OF THE EPSILON PHASE ON THE TEMP. DEPENDENCE. AS THE MN CONCN. DECREASES, THE ANOMALIES IN THE NORMAL ELASTIC MODULUS, THE INTERNAL FRACTION, AND THE COEFF. OF LINEAR EXPANSION AT THE NEEL POINT INCREASE. THIS IS APPARENTLY RELATED TO THE COMPLEX MAGNETIC STRUCTURE OF THE AUSTENITE: THE SUPERPOSITION OF THE CLOSE RANGE FERROMAGNETIC INTERACTION ON THE LONG RANGE ANTIFERROMAGNETIC ORDER. THIS IS CONFIRMED BY THE APPROX. COINCIDENCE IN THE CRIT. CONCNS. FOR THE MN, AT WHICH FERROMAGNETIC INTERACTION BETWEEN THE MN ATOMS BECOMES POSSIBLE AND ANOMALIES IN THE PHYS. PROPERTIES DEVELOP. FACILITY: URAL. POLITEKH. INST. IM. KIROVA, SVERDLOVSK, USSR. .

UNCLASSIFIED

UDC 669.15.24.74:539.379

USSR

BOGACHEV, I. N., CHUMAKOVA, L. D., and SHKLYAR, R. Sh., Sverdlovsk

"Change of the Substructure of Manganese and Nickel Austenitic Alloys in the Process of Micro-Impact Effect"

Moscow, Izvestiya Akademii Nauk SSSR, Metally, No 2, Mar-Apr 73, pp 164-169

Abstract: A study by the method of diffraction microroentgenography was made of structural changes on micro-impact loading arising in austenitic alloys on Fe-Ni and Fe-Mn bases, in order to explain the causes of their different behavior. Observed changes in specimens, 10 x 10 x 10 mm, of stable G38 and N40 alloys, subjected to micro-impact action on a magnetostrictive vibrator, are discussed by reference to microroentgenograms and diagrams showing the changes of the average size of fragments and of the average angle of disorientation of subgrains of these alloys. Annealing at 1200 °C was found to produce a nonuniform structure in Ni and Mn austenites. An intensive size reduction of fragments and an

1/2

USSR

BOGACHEV, I. N., et al., Izvestiya Akademii Nauk SSSR, Metally, No 2, Mar-Apr 73, pp 164-169

increasing angle of disorientation on micro-impact action is characteristic for austenitic Ni. A more gradual change of these parameters is observed on austenitic Mn. The hardening and the resistance to micro-impact loads of stable austenitic alloys depend on the degree of disorientation, the dimensions of substructural components, and the kinetics of their change in the process of deformation. Five figures, seven bibliographic references.

2/2

Microelectronics

USSR

UDC: 621.396.6.049.75(088.8)

BOGACHEV, M. P., BAZAITOV, V. F., KUZNETSOV, N. V., LYUBIMOV, A. I., MIKHAYLOV, N. A., NESTERENKO, Yu. F., PODOL'SKAYA, T. I., FROLOVA, I. S., KHVOSTOV, V. I.

"A Multilayered Printed Circuit Board"

USSR Author's Certificate No 265201, filed 18 Mar 68, published 23 Jun 70 (from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1V254 P)

Translation: A multilayered printed circuit board is proposed in which sections of foil which are a continuation of printed conductors entering holes in the board are used as leads from layer to layer. To cut down on the number of transitional connecting elements and to produce contact areas, the above-mentioned leads are fastened to the outer layer of the printed circuit board and used as contact areas for unsoldering circuit elements and wiring leads.

1/1

621.396.6-181.5(088.8)

ALEKHIN, M. I., BOGACHEV, N. M.

and Registration of Substrates and Masks"

tificate No 268523, filed 27 May 68, published 14 Aug 70

otekhnike, No 6, Jun 71, Abstract No 6V243 P)

ion: A device is proposed for transport and registration of masks
ubstrates for making thin-film microcircuits. The device contains
strate holders and mask holders which are connected to the drive mecha-
nism and located on transporting discs. The holders are equipped with
centering mechanisms such as pins and sockets, and with heating and cooling
elements. To simplify the design of the device and improve the quality
of the microcircuits, the mask holder is made in the form of a conical
rectangular base with its beveled surfaces resting on the socket or the
transporting disc, which is equipped with spring-loaded fingers. The upper
face of the substrate holder rests on stationary supports on the transport
disc socket, which is also fitted with spring-loaded fingers.

1/1

USSR UDC: 621.396.6-181.5(088.8)

GAVRILOV, R. A., REPIN, V. V., ALEKHIN, M. I., BOGACHEV, N. M.

"A Device for Transport and Registration of Substrates and Masks"

USSR Author's Certificate No 268523, filed 27 May 68, published 14 Aug 70 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6V243 P)

Translation: A device is proposed for transport and registration of masks and substrates for making thin-film microcircuits. The device contains substrate holders and mask holders which are connected to the drive mechanism and located on transporting discs. The holders are equipped with centering mechanisms such as pins and sockets, and with heating and cooling elements. To simplify the design of the device and improve the quality of the microcircuits, the mask holder is made in the form of a conical rectangular base with its beveled surfaces resting on the socket of the transporting disc, which is equipped with spring-loaded fingers. The upper face of the substrate holder rests on stationary supports on the transport disc socket, which is also fitted with spring-loaded fingers.

1/1

UDC 621.373.52.016.35

USSR

BOGACHEV, V. M., NIKIFOROV, V. V., Active Members of the Scientific and Technical Society of Radio Engineering, Electronics and Communications imeni A. S. Popov

"Parasitic Oscillations in Oscillators with External Excitation Caused by Internal Feedback in the Transistor"

Moscow, Radiotekhnika, Vol 27, No 1, 1972, pp 36-44

Abstract: A study was made of the frequency dependence of the stability coefficient of a cascade with a common emitter. The boundaries of the potential instability and the boundaries of the equivalent reactive parameter fields were determined for which the occurrence of parasitic oscillations is possible. Recommendations are made with respect to selecting the circuit parameters insuring stable operation of the oscillator. An analysis of the potential instability of the transistor was performed for reactive external loads, the region of instability was described for complex transistor loads, and the equivalent circuit of a parasitic autooscillator was developed. The expressions obtained permit determination of the stability coefficient, the boundaries of the instability zone and the conditions of its degeneration considering the spurious coupling through the active and passive capacitances of the collector junction and the current cutoff. The presence of the last two factors leads